AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1. (currently amended): A semiconductor laser module comprising:

a semiconductor laser element which emits laser light;

an optical wavelength selection element which selects a first portion of said laser light having a predetermined wavelength in order to feed back said first portion of said laser light to said semiconductor laser element; and

an optical wavelength conversion element which includes an optical waveguide, receives a second portion of said laser light in said optical waveguide, and converts said second portion of said laser light to wavelength-converted laser light having a converted wavelength;

said semiconductor laser element comprises a multiple-quantum-well active layer including a plurality of quantum-well sublayers each having a thickness and a composition, where one of the plurality of quantum-well sublayers is different from another of the plurality of quantum-well sublayers in at least one of the thickness and the composition,

wherein an optical wavelength range of an overall gain spectrum of said multiple-quantum-well active layer comprises a gain spectrum of said one of the plurality of quantum-well sublayers and a gain spectrum of said another of the plurality of quantum-well sublayers,

said gain spectrum of said one of the plurality of quantum-well sublayers being different from said gain spectrum of said another of the plurality of quantum-well sublayers, and

both said gain spectrum of said one of the plurality of quantum-well sublayers and said gain spectrum of said another of the plurality of quantum-well sublayers contributing to the optical wavelength range of said overall gain spectrum.

2. (original): A semiconductor laser module according to claim 1, wherein said optical wavelength selection element is a transparent-type optical wavelength selection element arranged between said semiconductor laser element and said optical wavelength conversion element, and selects said first portion of said laser light after said laser light is reflected by an end facet of said optical wavelength conversion element.

3. (original): A semiconductor laser module according to claim 1, further comprising,

an optical splitting unit which splits a third portion of said laser light from said second portion of said laser light which is received by said optical wavelength conversion element, and

a reflection unit which reflects said third portion of said laser light in order to feed back said third portion of said laser light to said semiconductor laser element, and said optical wavelength selection element is a transparent-type optical wavelength selection element arranged in an optical path of said third portion of said laser light between said reflection unit and said semiconductor laser element.

4. (original): A semiconductor laser module according to claim 3, wherein said optical wavelength selection element is a thin-film narrow-band-pass filter formed on a surface of said reflection unit.

5. (original): A semiconductor laser module according to claim 1, further comprising a reflection unit which reflects a third portion of said laser light after said third portion of said laser light propagates through said optical wavelength conversion element, in order to feed back said third portion of said laser light to said semiconductor laser element, and

said optical wavelength selection element is a transparent-type optical wavelength selection element arranged in an optical path of said third portion of said laser light between said reflection unit and said semiconductor laser element.

6. (original): A semiconductor laser module according to claim 5, wherein said optical wavelength selection element is a thin-film narrow-band-pass filter formed on a surface of said reflection unit.

7. (original): A semiconductor laser module according to claim 5, further comprising an optical system which separates said wavelength-converted laser light from said third portion of said laser light.

8. (original): A semiconductor laser module according to claim 1, further comprising a reflection unit which reflects a third portion of said laser light which is emitted from said semiconductor laser element in a direction opposite to a direction toward said optical wavelength conversion element, in order to feed back said third portion of said laser light to said semiconductor laser element, and

said optical wavelength selection element is a transparent-type optical wavelength selection element arranged in an optical path of said third portion of said laser light between said reflection unit and said semiconductor laser element.

9. (original): A semiconductor laser module according to claim 8, wherein said optical wavelength selection element is a thin-film narrow-band-pass filter formed on a surface of said reflection unit.

10. (original): A semiconductor laser module according to claim 1, wherein said optical wavelength selection element is a narrow-band-pass filter.

11. (original): A semiconductor laser module according to claim 10, wherein said narrow-band-pass filter is realized by a thin-film band-pass filter.

12. (original): A semiconductor laser module according to claim 11, wherein said thin-film band-pass filter is formed on a light-exit end facet of said semiconductor laser element from which said laser light is emitted.

13. (original): A semiconductor laser module according to claim 1, wherein said optical wavelength selection element is a reflection-type optical wavelength selection element arranged between said semiconductor laser element and said optical wavelength conversion element, and

selectively reflects said first portion of said laser light in order to feed back said first portion of said laser light to said semiconductor laser element.

14. (original): A semiconductor laser module according to claim 13, wherein said optical wavelength selection element is a fiber grating realized by an optical fiber having a core in which a plurality of refractive-index variation portions are formed at regular intervals.

15. (original): A semiconductor laser module according to claim 14, further comprising a convergence optical system which converges said laser light on an end surface of said fiber grating.

16. (original): A semiconductor laser module according to claim 1, wherein said optical wavelength selection element is a reflectance-type optical wavelength selection element, and selectively reflects said first portion of said laser light after said first portion of said laser light propagates through said optical wavelength conversion element, in order to feed back said first portion of said laser light to said semiconductor laser element.

17. (original): A semiconductor laser module according to claim 16, wherein said optical wavelength selection element is a fiber grating realized by an optical fiber having a core in which a plurality of refractive-index variation portions are formed at regular intervals.

18. (original): A semiconductor laser module according to claim 17, further comprising a convergence optical system which converges said laser light on an end surface of said fiber grating.

19. (original): A semiconductor laser module according to claim 16, further comprising an optical system which separates said wavelength-converted laser light from said second portion of said laser light after said second portion of said laser light propagates through said optical wavelength conversion element.

20. (original): A semiconductor laser module according to claim 1, wherein said first portion of said laser light is emitted by said semiconductor laser element in a direction opposite to a direction toward said optical wavelength conversion element, and said optical wavelength selection element is a reflectance-type optical wavelength selection element, and selectively reflects said first portion of said laser light in order to feed back said first portion of said laser light to said semiconductor laser element.

21. (original): A semiconductor laser module according to claim 20, wherein said optical wavelength selection element is a fiber grating realized by an optical fiber having a core in which a plurality of refractive-index variation portions are formed at regular intervals.

22. (original): A semiconductor laser module according to claim 21, further comprising a convergence optical system which converges said laser light on an end surface of said fiber grating.

23. (original): A semiconductor laser module according to claim 1, wherein said optical wavelength selection element is a bulk grating.

24. (original): A semiconductor laser module according to claim 1, wherein said semiconductor laser element is coupled to an end facet of said optical wavelength conversion element.

25. (original): A semiconductor laser module according to claim 1, wherein said optical wavelength conversion element further comprises,

a substrate made of a ferroelectric crystal exhibiting a nonlinear optical effect, where said optical waveguide is extends along a surface of said substrate, and

a plurality of domain-inverted portions periodically formed along said optical waveguide, where a direction of spontaneous polarization is inverted in said plurality of domain-inverted portions, and

said optical wavelength conversion element converts said second portion of said laser light to said wavelength-converted laser light when said second portion of said laser light propagates in said optical waveguide.

26. (original): A semiconductor laser module according to claim 25, wherein said direction of said spontaneous polarization is inclined at an angle relative to said surface of said substrate, in a plane perpendicular to a direction in which said optical waveguide extends, where said angle is greater than 0 degrees and smaller than 90 degrees.

27. (currently amended): A semiconductor laser module comprising:

a semiconductor laser element which has a light-exit end facet, and emits laser light through said light-exit end facet;

an optical wavelength conversion element which comprises an optical waveguide and an end facet, receives a first portion of said laser light having a predetermined wavelength in said optical waveguide, and converts said first portion of said laser light to wavelength-converted laser light having a converted wavelength, where said end facet of said optical wavelength conversion element reflects a second portion of said laser light, and said semiconductor laser element is coupled to said end facet of said optical wavelength conversion element through a transparent-type thin-film narrow-band-pass filter; and

said transparent-type thin-film narrow-band-pass filter which is sandwiched between said end facet of said optical wavelength conversion element and said light-exit end facet of said semiconductor laser element, and selects a third portion of said laser light having said predetermined wavelength, from said second portion of said laser light reflected by said end facet of said optical wavelength conversion element, in order to feed back said third portion of said laser light to said semiconductor laser element; and

said semiconductor laser element comprises a multiple-quantum-well active layer including a plurality of quantum-well sublayers each having a thickness and a composition, where one of the plurality of quantum-well sublayers is different from another of the plurality of quantum-well sublayers in at least one of the thickness and the composition,

wherein an optical wavelength range of an overall gain spectrum of said multiple-quantum-well active layer comprises a gain spectrum of said one of the plurality of quantum-well sublayers and a gain spectrum of said another of the plurality of quantum-well sublayers,

said gain spectrum of said one of the plurality of quantum-well sublayers being different from said gain spectrum of said another of the plurality of quantum-well sublayers, and

both said gain spectrum of said one of the plurality of quantum-well sublayers and said gain spectrum of said another of the plurality of quantum-well sublayers contributing to the optical wavelength range of said overall gain spectrum.

28. (original): A semiconductor laser module according to claim 27, wherein said optical wavelength conversion element further comprises,

a substrate made of a ferroelectric crystal exhibiting a nonlinear optical effect, where said optical waveguide is extends along a surface of said substrate, and

a plurality of domain-inverted portions periodically formed along said optical waveguide, where a direction of spontaneous polarization is inverted in said plurality of domain-inverted portions, and

said optical wavelength conversion element converts said first portion of said laser light to said wavelength-converted laser light when said first portion of said laser light propagates in said optical waveguide.

29. (original): A semiconductor laser module according to claim 28, wherein said direction of said spontaneous polarization is inclined at an angle relative to said surface of said substrate, in a plane perpendicular to a direction in which said optical waveguide extends, where said angle is greater than 0 degrees and smaller than 90 degrees.

30. (currently amended): A semiconductor laser module comprising:

a semiconductor laser element which has a light-exit end facet, and emits laser light through said light-exit end facet;

an optical wavelength conversion element which comprises an optical waveguide and an end facet, receives a first portion of said laser light having a predetermined wavelength in said optical waveguide, and converts said first portion of said laser light to wavelength-converted laser light having a converted wavelength, where said semiconductor laser element is coupled to said end facet of said optical wavelength conversion element through a reflection-type thin-film narrow-band-pass filter; and

said reflection-type thin-film narrow-band-pass filter which is sandwiched between said end facet of said optical wavelength conversion element and said light-exit end facet of said semiconductor laser element, and selectively reflects a second portion of said laser light having

said predetermined wavelength in order to feed back said second portion of said laser light to said semiconductor laser element; and

said semiconductor laser element comprises a multiple-quantum-well active layer including a plurality of quantum-well sublayers each having a thickness and a composition, where one of the plurality of quantum-well sublayers is different from another of the plurality of quantum-well sublayers in at least one of the thickness and the composition,

wherein an optical wavelength range of an overall gain spectrum of said multiple-quantum-well active layer comprises a gain spectrum of said one of the plurality of quantum-well sublayers and a gain spectrum of said another of the plurality of quantum-well sublayers,

said gain spectrum of said one of the plurality of quantum-well sublayers being different from said gain spectrum of said another of the plurality of quantum-well sublayers, and

both said gain spectrum of said one of the plurality of quantum-well sublayers and said gain spectrum of said another of the plurality of quantum-well sublayers contributing to the optical wavelength range of said overall gain spectrum.

31. (original): A semiconductor laser module according to claim 30, wherein said optical wavelength conversion element further comprises,

a substrate made of a ferroelectric crystal exhibiting a nonlinear optical effect, where said optical waveguide is extends along a surface of said substrate, and

a plurality of domain-inverted portions periodically formed along said optical waveguide, where a direction of spontaneous polarization is inverted in said plurality of domain-inverted portions, and

said optical wavelength conversion element converts said first portion of said laser light to said wavelength-converted laser light when said first portion of said laser light propagates in said optical waveguide.

32. (original): A semiconductor laser module according to claim 31, wherein said direction of said spontaneous polarization is inclined at an angle relative to said surface of said substrate, in a plane perpendicular to a direction in which said optical waveguide extends, where said angle is greater than 0 degrees and smaller than 90 degrees.

33-43 (Canceled)

44. (previously presented): A semiconductor laser module according to claim 1, wherein said plurality of quantum-well sublayers include:

a first quantum-well sublayer having a first thickness;

a second quantum-well sublayer having a second thickness;

a third quantum-well sublayer having a third thickness, wherein

the first thickness is different from the second thickness and third thickness, and the second thickness is different from the third thickness.

45. (previously presented): A semiconductor laser module according to claim 44, wherein said plurality of quantum-well sublayers include:

a first quantum-well sublayer having a first composition;

a second quantum-well sublayer having a second composition;

a third quantum-well sublayer having a third composition, wherein

the first composition is different from the second composition and third composition, and the second composition is different from the third composition.

46. (previously presented): A semiconductor laser module according to claim 45, wherein said plurality of quantum-well sublayers further includes:

a fourth quantum-well sublayer having a fourth thickness, wherein

the fourth thickness is different from the first thickness, the second thickness, and third thickness.